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Sean Thavonekham

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Patent Application for:

Steven Teig, et al.

Serial No.: 10/061,641

Filing Date: 01/31/2002

For: INTERCONNECT LINES WITH NON-  
RECTILINEAR POLYGONAL  
TERMINATIONS

Examiner: Thuan V. Do

Group Art Unit: 2825

**REPLY BRIEF**

COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

This is a Reply to an Examiner's Answer (mailed 9/26/06) in an Appeal from the final rejection of claims 1-18 in the above-referenced application. No fee is required with this Answer. Please note that 11/26/06 fell on a Sunday, and that this Reply is therefore timely. Please charge any additional fees or credit any overpayment to Deposit Account No.

**50-3804.**

## **I. REAL PARTY IN INTEREST**

The real party in interest to this Appeal is Cadence Design Systems, a Delaware Corporation, having its principal place of business in San Jose, California.

## **II. RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences known to the Appellants, the Appellants' legal representative, or assignees thereof.

## **III. STATUS OF CLAIMS**

Claims 1-18 are pending in the present application. The Examiner has rejected claims 1-18. Appellants hereby appeal the rejection of claims 1-18.

## **IV. STATUS OF AMENDMENTS**

No amendments to the application were submitted after final rejection.

## **V. SUMMARY OF CLAIMED SUBJECT MATTER**

### **A. Independent Claim 1**

Claim 1 shows an integrated-circuit ("IC") layout. The IC layout includes a net with routable elements. The IC layout includes a first set of interconnect lines for connecting the routable elements of the net, where the interconnect lines have ends that are in the shape of partial non-quadrilateral polygons.

Claim 1 is the sole independent claim; most of the dependent claims provide more specific details on the features of the partial polygons.

## **B. Dependent Claims**

### **1. Dependent Claim 4**

Claim 4 is dependent indirectly on claim 1. Claim 4 includes partial polygons that are partial octagons, where the partial octagons are half-octagons. *See e.g., Specification, page 99, lines 7-8; see also e.g., Figure 63.*

### **2. Dependent Claim 7**

Claim 7 is dependent indirectly on claim 1. Claim 7 includes partial polygons that are partial hexagons, where the partial hexagons are half-hexagons. *See e.g., Specification, page 99, lines 9-10; see also e.g., Figure 64.*

### **3. Dependent Claim 11**

Claim 11 is dependent indirectly on claim 1. Claim 11 includes partial octagon ends of the interconnect lines are half-octagons. *See e.g., Specification, page 99, lines 7-8; see also e.g., Figure 63.*

### **4. Dependent Claim 14**

Claim 14 is dependent indirectly on claim 1. Claim 14 includes partial hexagon ends of the interconnect lines are half-hexagons. *See e.g., Specification, page 99, lines 9-10; see also e.g., Figure 64.*

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

A. The Examiner rejected claims 1-18 under 35 U.S.C. § 102(b) as being unpatentable over United States Patent 5,117,277, issued to Yuyama, et al. ("Yuyama").

## **VII. ARGUMENT**

### **A. Overview**

The Examiner bases his rejection on the argument that the ends of the interconnects in Yuyama are partial polygons rather than complete polygons. In support of that argument, the Examiner says that the polygons at the ends of the interconnect lines are partial because they are contiguous with the interconnect lines themselves. However, as stated clearly in Yuyama and clearly shown in its figures, the interconnects of Yuyama have ends that are complete polygons, not partial polygons. Yuyama's disclosure and figures will now be described.

### **B. Yuyama does not show all the limitations of the claims**

Appellants respectfully submit that the cited reference does not anticipate the current claims. The legal standard for a finding of claim anticipation is clear: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

In the case of this application, Yuyama shows in its figures and in the text of its specification

that the interconnects of Yuyama end in regular (complete) polygons not partial ones. Yuyama describes ends that are regular hexagonal shaped, regular octagonal shaped, or in general regular polygonal shaped. See Yuyama, column 8, line 14; see also column 12, lines 44-47. However, nowhere in Yuyama does it describe these shapes as partial polygons.

In the Examiner's Answer, the Examiner appears to argue that the reason the polygons ends of Yuyama are partial polygons is that the interconnect is contiguous from the linear part of the interconnect to the end of the interconnect. For example, in the Examiner's response to Appellants' Appeal, the Examiner states the following:

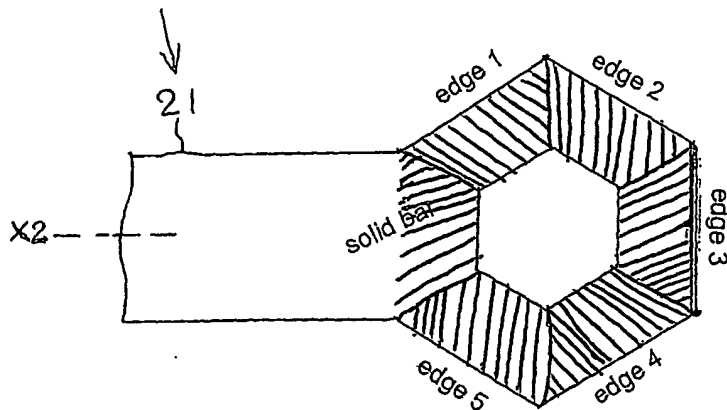
The interconnect line 21 is defined by one solid bar from the 2 edges of the interconnect lines prolonging to the ending portion of 5 edges of an hexagon shape continuously.

*(Examiner's Answer mailed September 26, 2006, page 5, emphasis original)*

The Examiner includes (*see Answer, page 5*) a copy of Appellants Exhibit A. Exhibit A was a copy of part of Figure 1 of Yuyama, relabeled by Appellants for emphasis. At the bottom of page 5 is a drawing of the Examiner's interpretation of the cited reference. What the examiner characterizes as a "solid bar" is shown in the figures of the cited reference with a line clearly dividing the interconnect itself from the complete polygon at the end of the interconnect. The Examiner's portion of the figure on page 5 is not a copy of anything from the cited reference, but rather, a redrawing of a portion of the figure by the Examiner.

The Examiner also states that "the complete hexagonal shape for the connection of the ending sides of 2 solid interconnect bars no. 21 and 22 in figure 1 of Yuyama is very similar to figure 69 of the application with the complete hexagonal shape connection surface or plane". However, the cited

figures are not similar. Figure 69 of the current application shows a connection in which only a partial hexagon exists at the end of connection lines. The inscribed hexagon does not represent the end of the connection. In contrast Figure 1 of the cited reference shows a complete hexagon at the ends of connection lines.



### C. Edited copy of Examiner's Figure

The Figure above shows an interconnect of Yuyama as drawn by the Examiner, with cross-hatching added by Appellants. The interconnect has an end that is a complete hexagon (as shown by the cross-hatching). The end of the interconnect is a complete hexagon even though the hexagon is connected on one side to an interconnect. The Examiner's argument would require that, in order to be a complete hexagon, the end of the interconnect would have to be separated from the rest of the interconnect by an artificial boundary or discontinuity rather than being a "solid bar" as shown. However, an interconnect connects. If it were discontinuous, it would be a disconnect, not an interconnect. The Examiner's alternate interpretation of the "partial" limitation distinguishes between interconnects that are continuous to the end and interconnects that are completely separate

from their ends. However, this interpretation does not follow the claim language. Furthermore, an artificial boundary/disconnect in the interconnect would destroy or hinder the electrical connection that is the reason for having an interconnect in the first place.

**D. The claim does not cover the interconnect of Yuyama**

The legal standard for anticipation is the same as the standard for infringement. “[T]hat which would literally infringe if later in time anticipates if earlier,” *Bristol-Myers Squibb Co. v. Ben Venue Labs., Inc.*, 246 F.3d 1368, 1378 (Fed. Cir. 2001). Appellants respectfully submit that the term “partial polygon” prevents Appellants’ claims from covering the invention of Yuyama. Claims must be interpreted so as to give every limitation meaning. Under the Examiner’s interpretation, there would be no difference between a limitation of “ends that are in the shape of polygons” and “ends that are in the shape of partial polygons”. This would be a violation of the principle of claim interpretation cited above.

Moreover, this interpretation would not only ignore the existence of the word “partial” as a limitation of “polygon”, but it would also eviscerate the plainly stated descriptions of the ends in Yuyama. Yuyama does not merely describe ends that have “hexagonal”, “octagonal” or “polygonal” shapes, rather it describes ends that have “regular hexagonal” “regular octagonal” or “regular polygonal” shapes. See Yuyama., column 8, line 14; see also column 12, lines 44-47. A regular polygon is a complete polygon with all sides and all angles equal, not a partial polygon.

Characterizing a “regular” polygon as being the same as a “partial” polygon requires ignoring the plain meaning of not only Appellants’ claim limitations, but also the plain meaning of the cited reference. Appellants respectfully submit that it is therefore an improper interpretation, and cannot be

the basis of a legitimate rejection.

**E. Clarifications**

Appellants would like to make it clear that the figures shown on page 7 of the Examiner's Answer are figures from Appellants' own application, not from the cited reference. Further, these figures support Appellants' position, not the Examiner's. These figures show examples of the partial polygons of the current claims. These are clearly partial polygons, and not the complete polygons of the cited reference.



## VIII. CONCLUSION

In view of the foregoing, Appellants respectfully submit that the claims are patentable. Appellants hereby request that the Board overturn the Examiner's finding that the claims are unpatentable under 35 U.S.C. § 102.

Respectfully submitted,

Dated: November 27, 2006

By: 

Sean Thavonekham  
Registration No. 58,611

Stattler, Johansen & Adeli LLP  
1875 Century Park East, Suite 1360  
Los Angeles, California 90067  
Telephone: (310) 785-0140  
Facsimile: (310) 785-9558